

REMARKS

The Office Action mailed July 29, 2004 has been carefully reviewed and the following remarks are made in consequence thereof.

Claims 1-31 are now pending in this application. Claims 1-31 stand rejected.

The undersigned wishes to express his appreciation to the Examiner for the courtesies that he extended William Zychlewicz during a telephone interview that occurred on October 28, 2004. The 35 U.S.C. § 112, first and second paragraph rejections of Claims 1 and 15 were discussed. Applicants have amended Claims 1 and 15 in accordance with those discussions to place the application in condition for allowance. Specifically, Claims 1 and 15 have been amended to recite "wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel." The following amendment has been made in consequence thereof.

The rejection of Claims 1-31 under 35 U.S.C. §112, first paragraph is respectfully traversed.

With respect to the assertion that there is no basis in the original specification for the limitation "wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel", Applicants respectfully disagree and submit that the application as filed, does in fact support the above-referenced claim limitation. The Federal Circuit has opined in *Verve LLC v. Crane Cams, Inc.*, 65 USPQ 2d 1051, 1053-1054 (Fed. Cir. 2002), that "[p]atent documents are written for persons familiar with the relevant field; the patentee is not required to include in the specification information readily understood by practitioners, lest every patent be written as a comprehensive tutorial and treatise for the generalist, instead of a concise statement for persons in the field."

Applicants respectfully submit that one of ordinary skill in the art, after reading the specification in view of the Figures, would agree that the subject matter in the specification is described in such a manner as to reasonably convey that the Applicants have possession of the claimed invention, at the time the application was filed. Furthermore, it is readily known in the art that as a vector quantity, the vector distance between the two antennas has both a magnitude component and a direction component. The method of the present invention uses

the two antennas to determine the vector distance between the two antennas. The two antennas are mounted on the locomotive spaced apart by a known distance magnitude. With the vector distance between the two antennas known and the distance magnitude between the two antennas known, it is elementary to determine the direction component of the distance vector. Further, each GPS system determines the absolute position of its respective antenna. Accordingly, the direction component of the heading vector of the longitudinal axis of the locomotive is known and the absolute position of each antenna is known, therefore the heading of the locomotive is known and which antenna is in the lead is known (from the absolute position). Applicants respectfully submit that the original specification describes an accurate heading of the locomotive during normal locomotive transit operation using the set of phase differences between the satellite reference signals, wherein the locomotive is self-propelled or propelled in a consist with other locomotives, wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel.

Applicant submits that the specification as originally filed is complete and does describe the limitation such that at one skilled in the art would understand the present invention. For example, at page 1, lines 6-7 the specification recites the invention as “determining movement and direction of a track-bound transportation apparatus using GPS satellites.” Applicants respectfully submit that the level of skill in the art of locomotive operation, and specifically direction of travel of the locomotive and which end of the locomotive is in the lead in the direction of travel is sufficiently high that the ordinary skilled artisan would be able understand what is meant by determining movement and direction of a track-bound transportation apparatus using GPS satellites.

Furthermore, at page 6, line 6, for example, heading is recited as being equal to “ $\tan^{-1} d_x/d_y$ ”, wherein d_x and d_y are vector components of the vector distance between the two antennas, within an x , y , and z coordinate system, defined on page 5, lines 3-4 as being referenced to “east, north and up, respectively.” Applicants respectfully submit that the level of skill in the art of locomotive operation, and specifically direction of travel of the locomotive and which end of the locomotive is in the lead in the direction of travel is sufficiently high that the ordinary skilled artisan would be able understand what is meant by the term “heading” as modified by the phrase “wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab

forward or cab reverse orientation of travel" and its corresponding cited formula above. Accordingly, Applicants submit that Claims 1-31 meet the requirements of section 112, first paragraph.

For the reasons set forth above, Applicants respectfully request that the Section 112 rejection of Claims 1-31 be withdrawn.

The rejection of Claims 1-31 under 35 U.S.C. §112, second paragraph is respectfully traversed. It is respectfully submitted that Applicants have not elected to be their own lexicographer in this instance, and that the term "heading" is not used by the claim to mean "direction of travel", but rather the use of the term "heading" is modified and limited by the phrase "wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel" in Applicants' specification and claims. Such a definition of heading is entirely consistent with the ordinary meaning of heading, as would be understood by one of ordinary skill in the art at the time the application was filed. Specifically, Applicants respectfully submit that the phrase "wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel" only modifies the common meaning of the term "heading" such that a locomotive traveling in a consist and with a cab forward configuration has generally the same heading, or direction of travel, as a locomotive traveling in the same consist in a cab reverse configuration.

Moreover, Applicants respectfully submit both the term "heading" and the phrase "wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel" are defined in the specification and support the definiteness of the recitations within the claims. For example, at page 1, lines 6-7 the specification recites the invention as "determining movement and direction of a track-bound transportation apparatus using GPS satellites." At page 6, line 6, for example, heading is recited as being equal to " $\tan^{-1}d_x/d_y$ ", wherein d_x and d_y are vector components of the vector distance between the two antennas, within an x , y , and z coordinate system, defined on page 5, lines 3-4 as being referenced to "east, north and up, respectively."

As a vector quantity, the vector distance between the two antennas has both a magnitude component and a direction component. The method of the present invention uses

the two antennas to determine the vector distance between the two antennas. The two antennas are mounted on the locomotive spaced apart by a known distance magnitude. With the vector distance between the two antennas known and the distance magnitude between the two antennas known, it is elementary to determine the direction component of the distance vector. Further, each GPS system determines the absolute position of its respective antenna. Accordingly, the direction component of the heading vector of the longitudinal axis of the locomotive is known and the absolute position of each antenna is known, therefore the heading of the locomotive is known and which antenna is in the lead is known (from the absolute position). Applicants respectfully submit that the original specification describes an accurate heading of the locomotive during normal locomotive transit operation using the set of phase differences between the satellite reference signals, wherein the locomotive is self-propelled or propelled in a consist with other locomotives, wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel.

The accuracy of the heading determination during some portions of travel, such as traveling through or entering curves, is not claimed nor addressed in the specification and may also be affected by other operations that are also not addressed in the claims or specification. With respect to the arguments set forth with respect to Claims 1-31, Applicants respectfully submit that one of ordinary skill in the art after reading the original specification, in light of the figures, would understand what is meant by the term "heading" as modified by the phrase "wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel."

Applicants further submit that the dictionary definition relied on in the Office Action is incomplete with respect to locomotives. Specifically, the dictionary definition of heading cited in the Office Action uses a ship and an aircraft as exemplary vehicles for which the definition of heading applies. It is known that ships rarely travel in a reverse direction except for maneuvering close to berth, and aircraft are incapable of normal operation in a reverse direction, but locomotives routinely travel extended distances in a cab forward configuration or a cab reverse configuration. A consist may include any number of locomotives operating in a cab forward configuration in tandem with any number of locomotives operating in a cab reverse configuration. In this scenario, using the dictionary definition of heading, the heading

of the locomotives in the cab reverse configuration is approximately one hundred and eighty degrees displaced from the heading of the locomotives in the cab forward configuration. Using the term "heading", as modified by the phrase "wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel" permits all locomotives in a consist, whether in a cab forward or cab reverse configuration to determine their direction of travel accurately. Generally, the direction of travel of a consist or a single locomotive is of interest and not the compass direction in which the longitudinal axis points. Accordingly, Applicants submit that Claims 1-31 meet the requirements of section 112, second paragraph.

The rejection of Claims 4 and 18 under 35 U.S.C. §112, second paragraph is respectfully traversed. Specifically, the specification has been amended to delete "pitch" and insert "heading rate" in accordance with the recitations of Claims 4 and 18. Accordingly, for at least the reasons set forth above, Applicants respectfully request the Section 112 rejections of Claims 4 and 18 be withdrawn.

The rejection of Claims 1-4, 12-18, and 28-31 under 35 U.S.C. § 102(e) as being anticipated by Hrovat et al. ("Hrovat") (U.S. Pat. No. 6,184,821) is respectfully traversed.

Hrovat describes a system for deriving one or more parameters involving one or more aspects of an automotive vehicle's (10) dynamics. The system includes two Global Positioning System (GPS) sensors (14 and 16) in electronic communication with a processor (18). The processor is configured to execute a programmed algorithm for calculating an angle between the vehicle centerline and one axis of the X-Y coordinate system. Notably, Hrovat does not describe nor suggest determining an accurate heading of a locomotive wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel. Additionally, in contrast to the assertion within the Office Action, determining a vector distance between two antennas using the formula in Hrovat is not inherent. Furthermore, in contrast to the assertion within the Office Action, determining a distance traveled using the formula in Hrovat is not inherent. Hrovat does not describe nor suggest a method that includes determining parameters utilizing the Z-axis.

Claim 1 recites a method that includes "determining an accurate heading of the locomotive during normal locomotive transit operation using the set of phase differences

between the satellite reference signals, wherein the locomotive is self-propelled or propelled in a consist with other locomotives, wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel.”

Hrovat does not describe nor suggest a method that includes determining an accurate heading of the locomotive during normal locomotive transit operation using the set of phase differences between the satellite reference signals, wherein the locomotive is self-propelled or propelled in a consist with other locomotives, wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel. Rather in contrast to the present invention, Hrovat describes a system that is configured to execute a programmed algorithm for calculating an angle between an automotive vehicle’s centerline and one axis of the X-Y coordinate system. Accordingly, for at least the reasons set forth above, Claim 1 is submitted to be patentable over Hrovat.

Claims 2-4, 12-14, and 30 depend from independent Claim 1. When the recitations of Claims 2-4, 12-14, and 30 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 2-4, 12-14, and 30 are likewise patentable over Hrovat.

Claim 15 recites an apparatus for determining at least one of motion and location parameters of a railroad locomotive to detect curves and reduce track wear, with the locomotive oriented with either end of the locomotive in the lead in the direction of travel of the locomotive wherein the apparatus includes “at least two phase-locking satellite receivers configured to reference signals received from a set of satellites...a processor configured to determine a set of phase differences between the reference signals received by said satellite receivers and an accurate heading of the locomotive during normal locomotive transit operation using the set of phase differences between the reference signals, wherein the locomotive is self-propelled or propelled in a consist with other locomotives, wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel.”

Hrovat does not describe nor suggest an apparatus for determining at least one of motion and location parameters of a locomotive to detect curves and reduce track wear, with

either end of the locomotive in the lead in the direction of travel of the locomotive wherein the apparatus includes at least two phase-locking satellite receivers configured to reference signals received from a set of satellites, a processor configured to determine a set of phase differences between the reference signals received by the satellite receivers and an accurate heading of the locomotive during normal locomotive transit operation using the set of phase differences between the reference signals, wherein the locomotive is self-propelled or propelled in a consist with other locomotives, wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel.

Specifically, Hrovat does not describe or suggest a processor configured to determine a set of phase differences between the reference signals received by the satellite receivers and an accurate heading of the locomotive during normal locomotive transit operation using the set of phase differences between the reference signals, wherein the locomotive is self-propelled or propelled in a consist with other locomotives, wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel. Rather in contrast to the present invention, Hrovat describes a system that is configured to execute a programmed algorithm for calculating an angle between an automotive vehicle's centerline and one axis of the X-Y coordinate system. Accordingly, for at least the reasons set forth above, Claim 15 is submitted to be patentable over Hrovat.

Claims 16-18, 28, 29, and 31 depend from independent Claim 15. When the recitations of Claims 16-18, 28, 29, and 31 are considered in combination with the recitations of Claim 15, Applicants submit that dependent Claims 16-18, 28, 29, and 31 are likewise patentable over Hrovat.

For at least the reasons set forth above, Applicants respectfully request that the Section 102 rejection of Claims 1-4, 12-18, and 28-31 be withdrawn.

The rejection of Claims 5, 10, 11, 19, and 24-27 under 35 U.S.C. § 103(a) as being unpatentable over Hrovat as applied to Claims 1 and 15 above, and further in view of Kumar (U.S. Pat. No. 5,896,947) is respectfully traversed.

Hrovat is described above. Kumar describes a method for simultaneously lubricating the rail gage side (RAGS) and wheel flanges ahead of a locomotive's 1 tractive wheels and lubricating the top of the rail (TOR) behind the tractive wheels to reduce the resistance of the trailing cars and reduce the locomotive wheel flange wear. The method includes controlling both lubricating units with the same computer controller 2 when a single locomotive 1 is used and two controllers 2F, 2R located in two different locomotives 1 in the case of a train consist 10.

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. Obviousness cannot be established by merely suggesting that it would have been an obvious to one of ordinary skill in the art to "use the invention of Kumar with Hrovat because such modification would make a track lubrication system that measures track curvature better which would make distributing the correct amount of lubricant easier...." More specifically, it is respectfully submitted that a prima facie case of obviousness has not been established. As explained by the Federal Circuit, "to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant." In re Kotzab, 54 USPQ2d 1308, 1316 (Fed. Cir. 2000). MPEP 2143.01. Moreover, the Federal Circuit has determined that:

[I]t is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that "[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention."

In re Fitch, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992). Further, under Section 103, "it is impermissible...to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art." In re Wesslau, 147 USPQ 391, 393 (CCPA 1965). Rather, there must be some suggestion, outside of Applicants' disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicants' disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991). In the present case, neither a suggestion nor motivation to combine the cited art, nor any reasonable expectation of success has been shown.

Although it is asserted within the Office Action that Hrovat teaches the present invention except for dispensing track lubricant in accordance with track curvature when the curvature is greater than a predetermined magnitude, and that Kumar teaches dispensing track lubricant in accordance with track curvature and when the curvature is greater than a predetermined magnitude, no motivation nor suggestion to combine the cited art has been shown. Rather, Applicants submit that Hrovat teaches away from Kumar in that Hrovat describes a system that is configured to execute a programmed algorithm for calculating an angle between an automotive vehicle's centerline and one axis of the X-Y coordinate system, while in contrast, Kumar describes a method for simultaneously lubricating the rail gage side (RAGS) and wheel flanges ahead of a locomotive's tractive wheels and lubricating the top of the rail (TOR) behind the locomotive's tractive wheels. Since there is no teaching nor suggestion in the cited art for the claimed combination, the Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants request that the Section 103 rejection of Claims 5, 10, 11, 19, and 24-27 be withdrawn.

Moreover, if art "teaches away" from a claimed invention, such a teaching supports the nonobviousness of the invention. U.S. v. Adams, 148 USPQ 479 (1966); Gillette Co. v. S.C. Johnson & Son, Inc., 16 USPQ2d 1923, 1927 (Fed. Cir. 1990). In light of this standard, it is respectfully submitted that the cited art, as a whole, is not suggestive of the presently claimed invention. More specifically, Applicants respectfully submit, as described above, that Hrovat teaches away from Kumar, and as such, thus supports the nonobviousness of the present invention. Consequently, the presently pending claims are patentably distinguishable from the cited combination.

In addition, and to the extent understood, no combination of Hrovat and Kumar describes or suggests the claimed invention. Specifically, Claim 1 recites a method that includes "determining an accurate heading of the locomotive during normal locomotive transit operation using the set of phase differences between the satellite reference signals, wherein the locomotive is self-propelled or propelled in a consist with other locomotives, wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel."

No combination of Hrovat and Kumar, describes or suggests a method that includes determining an accurate heading of the locomotive during normal locomotive transit operation using the set of phase differences between the satellite reference signals, wherein the locomotive is self-propelled or propelled in a consist with other locomotives, wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel. Rather, in contrast to the present invention, Hrovat describes a system that is configured to execute a programmed algorithm for calculating an angle between an automotive vehicle's centerline and one axis of the X-Y coordinate system, and Kumar describes a method for simultaneously lubricating the rail gage side (RAGS) and wheel flanges ahead of a locomotive's tractive wheels and lubricating the top of the rail (TOR) behind the locomotive's tractive wheels. Accordingly, for at least the reasons set forth above, Claim 1 is submitted to be patentable over Hrovat in view of Kumar.

Claims 5, 10, and 11 depend, directly or indirectly, from independent Claim 1. When the recitations of Claims 5, 10, and 11 are considered in combination with the recitations of Claim 1, Applicants submit that Claims 5, 10, and 11 likewise are patentable over Hrovat in view of Kumar.

Claim 15 recites an apparatus for determining at least one of motion and location parameters of a railroad locomotive to detect curves and reduce track wear, with the locomotive oriented with either end of the locomotive in the lead in the direction of travel of the locomotive wherein the apparatus includes "at least two phase-locking satellite receivers configured to reference signals received from a set of satellites...a processor configured to determine a set of phase differences between the reference signals received by said satellite receivers and an accurate heading of the locomotive during normal locomotive transit operation using the set of phase differences between the reference signals, wherein the locomotive is self-propelled or propelled in a consist with other locomotives, wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel."

No combination of Hrovat and Kumar describes or suggests an apparatus for determining at least one of motion and location parameters of a railroad locomotive to detect curves and reduce track wear, with the locomotive oriented with either end of the locomotive in the lead in the direction of travel of the locomotive wherein the apparatus includes at least

two phase-locking satellite receivers configured to reference signals received from a set of satellites, a processor configured to determine a set of phase differences between the reference signals received by said satellite receivers and an accurate heading of the locomotive during normal locomotive transit operation using the set of phase differences between the reference signals, wherein the locomotive is self-propelled or propelled in a consist with other locomotives, wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel. Rather, in contrast to the present invention, Hrovat describes a system that is configured to execute a programmed algorithm for calculating an angle between an automotive vehicle's centerline and one axis of the X-Y coordinate system, and Kumar describes a method for simultaneously lubricating the rail gage side (RAGS) and wheel flanges ahead of a locomotive's tractive wheels and lubricating the top of the rail (TOR) behind the locomotive's tractive wheels. Accordingly, for at least the reasons set forth above, Claim 15 is submitted to be patentable over Hrovat in view of Kumar.

Claims 19 and 24-27 depend, directly or indirectly, from independent Claim 15. When the recitations of Claims 19 and 24-27 are considered in combination with the recitations of Claim 15, Applicants submit that Claims 19 and 24-27 likewise are patentable over Hrovat in view of Kumar.

For at least the reasons set forth above, Applicants respectfully requests that the Section 103 rejection of Claims 5, 10, 11, 19, and 24-27 be withdrawn.

The rejection of Claims 6-9 and 20-23 under 35 U.S.C. § 103(a) as being unpatentable over Hrovat and Kumar, as applied above, and further in view of Bidaud (U.S. Pat. No. 6,347,265) is respectfully traversed.

Hrovat and Kumar are described above. Bidaud describes a track analyzer included on a vehicle (28) traveling on a track (10) includes a vertical gyroscope (20) for determining a grade and an elevation of the track. A rate gyroscope (50) determines a curvature of the track. A speed determiner (70) determines a speed of the vehicle relative to the track. A distance determiner (91) determines a distance the vehicle has traveled along the track. Also, the direction in which the vehicle is moving, meaning forward or backward, is determined by whether the phase of a first plate (112) leads/lags the phase of a second plate (114).

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. Obviousness cannot be established by merely suggesting that it would have been an obvious to one of ordinary skill in the art to “use the curvature finding methods of Bidaud in the invention of Hrovat and Kumar because such modification would allow the use of both satellite signals and inertial sensors to both measure the same values and act as redundant systems, or use both systems to improve accuracy of both measurements.” More specifically, it is respectfully submitted that a prima facie case of obviousness has not been established. As explained by the Federal Circuit, “to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant.” In re Kotzab, 54 USPQ2d 1308, 1316 (Fed. Cir. 2000). MPEP 2143.01. Moreover, the Federal Circuit has determined that:

[I]t is impermissible to use the claimed invention as an instruction manual or “template” to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that “[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.”

In re Fitch, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992). Further, under Section 103, “it is impermissible...to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art.” In re Wesslau, 147 USPQ 391, 393 (CCPA 1965). Rather, there must be some suggestion, outside of Applicants' disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicants' disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991). In the present case, neither a suggestion nor motivation to combine the cited art, nor any reasonable expectation of success has been shown.

Although it is asserted within the Office Action that Hrovat and Kumar teach the present invention except for the track curvature is determined from angular rotation determined from satellite signals and velocity, angular rotation is found from a gyro and vehicle speed from a tachometer, or finding curvature from lateral acceleration and velocity, and that Bidaud discloses the track curvature is determined from angular rotation and velocity, angular rotation is found from a gyro and vehicle speed from a tachometer, or

finding curvature from lateral acceleration and velocity. Rather, Applicants submit that Hrovat teaches away from Kumar and Bidaud in that Hrovat describes a system that is configured to execute a programmed algorithm for calculating an angle between an automotive vehicle's centerline and one axis of the X-Y coordinate system, while in contrast Kumar describes a method for simultaneously lubricating the rail gage side (RAGS) and wheel flanges ahead of a locomotive's tractive wheels and lubricating the top of the rail (TOR) behind the locomotive's tractive wheels. Furthermore, Bidaud describes a track analyzer included on a vehicle traveling on a track for determining a grade and an elevation of the track, a curvature of the track, a speed of the vehicle relative to the track, a distance the vehicle has traveled along the track, and the direction in which the vehicle is moving, either forward or backward. Since there is no teaching nor suggestion in the cited art for the claimed combination, the Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants request that the Section 103 rejection of Claims 6-9 and 20-23 be withdrawn.

Moreover, if art "teaches away" from a claimed invention, such a teaching supports the nonobviousness of the invention. U.S. v. Adams, 148 USPQ 479 (1966); Gillette Co. v. S.C. Johnson & Son, Inc., 16 USPQ2d 1923, 1927 (Fed. Cir. 1990). In light of this standard, it is respectfully submitted that the cited art, as a whole, is not suggestive of the presently claimed invention. More specifically, Applicants respectfully submit, as described above, that Hrovat teaches away from Kumar and Bidaud, and as such, thus supports the nonobviousness of the present invention. Consequently, the presently pending claims are patentably distinguishable from the cited combination.

In addition, and to the extent understood, no combination of Hrovat, Kumar, and Bidaud, describes or suggests the claimed invention. Specifically, Claim 1 recites a method that includes "determining an accurate heading of the locomotive during normal locomotive transit operation using the set of phase differences between the satellite reference signals, wherein the locomotive is self-propelled or propelled in a consist with other locomotives, wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel."

No combination of Hrovat, Kumar, and Bidaud, describes or suggests a method that includes determining an accurate heading of the locomotive during normal locomotive transit operation using the set of phase differences between the satellite reference signals, wherein the locomotive is self-propelled or propelled in a consist with other locomotives, wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel. Rather, in contrast to the present invention, Hrovat describes a system that is configured to execute a programmed algorithm for calculating an angle between an automotive vehicle's centerline and one axis of the X-Y coordinate system, and Kumar describes a method for simultaneously lubricating the rail gage side (RAGS) and wheel flanges ahead of a locomotive's tractive wheels and lubricating the top of the rail (TOR) behind the locomotive's tractive wheels. Furthermore, Bidaud describes a track analyzer included on a vehicle traveling on a track for determining a grade and an elevation of the track, a curvature of the track, a speed of the vehicle relative to the track, a distance the vehicle has traveled along the track, and the direction in which the vehicle is moving, either forward or backward. Accordingly, for at least the reasons set forth above, Claim 1 is submitted to be patentable over Hrovat and Kumar in view of Bidaud.

Claims 6-9 depend, directly or indirectly, from independent Claim 1. When the recitations of Claims 6-9 are considered in combination with the recitations of Claim 1, Applicants submit that Claims 6-9 likewise are patentable over Hrovat and Kumar in view of Bidaud.

Claim 15 recites an apparatus for determining at least one of motion and location parameters of a railroad locomotive to detect curves and reduce track wear, with the locomotive oriented with either end of the locomotive in the lead in the direction of travel of the locomotive wherein the apparatus includes "at least two phase-locking satellite receivers configured to reference signals received from a set of satellites...a processor configured to determine a set of phase differences between the reference signals received by said satellite receivers and an accurate heading of the locomotive during normal locomotive transit operation using the set of phase differences between the reference signals, wherein the locomotive is self-propelled or propelled in a consist with other locomotives, wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel."

No combination of Hrovat, Kumar, and Bidaud, describes or suggests an apparatus for determining at least one of motion and location parameters of a railroad locomotive to detect curves and reduce track wear, with the locomotive oriented with either end of the locomotive in the lead in the direction of travel of the locomotive wherein the apparatus includes at least two phase-locking satellite receivers configured to reference signals received from a set of satellites and a processor configured to determine a set of phase differences between the reference signals received by said satellite receivers and an accurate heading of the locomotive during normal locomotive transit operation using the set of phase differences between the reference signals, wherein the locomotive is self-propelled or propelled in a consist with other locomotives, wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel. Rather, in contrast to the present invention, Hrovat describes a system that is configured to execute a programmed algorithm for calculating an angle between an automotive vehicle's centerline and one axis of the X-Y coordinate system, and Kumar describes a method for simultaneously lubricating the rail gage side (RAGS) and wheel flanges ahead of a locomotive's tractive wheels and lubricating the top of the rail (TOR) behind the locomotive's tractive wheels. Furthermore, Bidaud describes a track analyzer included on a vehicle traveling on a track for determining a grade and an elevation of the track, a curvature of the track, a speed of the vehicle relative to the track, a distance the vehicle has traveled along the track, and the direction in which the vehicle is moving, either forward or backward. Accordingly, for at least the reasons set forth above, Claim 15 is submitted to be patentable over Hrovat and Kumar in view of Bidaud.

Claims 20-23 depend, directly or indirectly, from independent Claim 15. When the recitations of Claims 20-23 are considered in combination with the recitations of Claim 15, Applicants submit that Claims 20-23 likewise are patentable over Hrovat and Kumar in view of Bidaud.

For at least the reasons set forth above, Applicants respectfully requests that the Section 103 rejection of Claims 6-9 and 20-23 be withdrawn.

In view of the foregoing amendments and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read 'R. B. Reeser III', is written over a horizontal line.

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